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ABSTRACT

Agile development methods are widely used and continue to grow in their adoption. A theoretical understanding of agile is needed. This research plan uses a Grounded Theory approach to develop antecedents to managerial preference for agile development methods. First, we provide the motivation for the research. Next, we provide a brief literature review to orient the research to the domain. Finally, we discuss the research methodology and research plan.

Keywords

Agile, software, management, project management, preference

INTRODUCTION

The use of agile development methods in software development and project management is becoming popular in a world demanding support for constant change and innovation. The use of agile methods is still on the rise. The 2015 VersionOne State Of Agile™ survey shows that while 93% of respondents' organizations practice agile, only 43% of respondents' organizations had the majority of their teams using agile. The result is that 53% of companies have less than half of their teams using agile methods (VersionOne, 2016). The statistics indicate agile is widely used, and there is still significant opportunity for further adoption.

The variation in manager preferences for various development methodologies is growing at a rapid rate as well. A portion of the preferences are attributed to various characteristics of methodologies. The fit of the solution, the circumstances of the problem and the nature of the challenge influence the effectiveness of methodology. Agile development is defined as an excellent fit when circumstances require that the project is ambitious, there is a need for modifying deliverables with frequent input from the customer, and where rapid delivery is necessary (Conforto, Salum, Amaral, da Silva, and de Almeida, 2014). In addition, the agile development method lends itself to iterative and incremental development, customer collaboration, and frequent delivery (Cho, 2008). Speed, efficiency, collaboration and change management are considered key attributes of agile development (Rao, Naidu, and Chakka, 2011).

There is a lack of understanding of the manager preference for agile development methods. The goal of this study is to contribute by identifying factors that influence managerial preferences for Agile Software Development. The investigation will consider manager preferences for development methodologies with an open lens to fully understand the influences and perceptions of the managers.

This article first presents a literature review. Next, it describes the methodology to investigate the managerial preferences for agile. It concludes with implications for research and practice.

LITERATURE REVIEW

There have been theoretical developments to extend agile development principles to a variety of different contexts such as large and dynamic software development projects (Batra, VanderMeer, and Dutta, 2011), distributed software development projects (Bergadano, Bosio, and Spagnolo, 2014), data warehousing and business intelligence projects (Rahman, Rutz, and Akhter, 2013), and game development projects (Cano, González, Collazos, Arteaga, and Zapata, 2015). The extant literature on agile project management has focused on comparing traditional plan-driven approaches with incremental approaches (Ceschi, Sillitti, Succi, and De Panfilis, 2005; Coram and Bohner, 2005; Fernandez and Fernandez, 2008). These papers focus on the practices and processes indicating that agile is a better solution. The

authors identify ways for managers to evaluate the use of agile method. It is unclear how project managers form their preference for or against agile methods. There is limited research on understanding project managers' attitudes towards the agile development method. This is an important research question to study as managers rationalize their choice of methods seeking to improve project performance and team effectiveness.

Research suggests that the adoption of agile is driven by several influential factors such as project size, application criticality, complexity, employee skillset, and company culture (Boehm and Turner, 2003; Nerur, Mahapatra, and Mangalaraj, 2005; Vinekar, Slinkman, and Nerur, 2006). The emphasis in agile development is on teams and team interactions and dynamics. Management is defined as a process of planning, organizing, leading, and controlling. Within agile development, the traditional role of the project manager changes from 'command and control' to more of a 'coach or facilitator' (Vinekar et al., 2006). The project manager now has the responsibility of managing the collaborative efforts of the team without stifling their creativity. Managers need to be flexible to leverage each team member's expertise (Cockburn and Highsmith, 2001). This focus is significantly different than traditional systems where the focus was on the process. Taylor's research focused on understanding how agile techniques shaped the practices of project managers, and how they dealt with conflict (Taylor and Taylor, 2016). Her findings focused on how change in methods influence human experience and can cause some conflict. She also identified how project managers should relinquish some control when using agile.

Organizational cultures and management have an influence on development methods. Research has been extensively conducted on the tensions and trade-offs between stability and agility in organizational management (Benner and Tushman, 2003; Gibson and Birkinshaw, 2004; He and Wong, 2004). The literature on organizational theory and learning provides solid reasoning for providing an organizational climate conducive to adapting to change. This adaptation is positively associated with superior performance (Gibson and Birkinshaw, 2004; He and Wong, 2004).

Vinekar, et al. summarized the opposing characteristics of agile and traditional development methods as related to management (Vinekar et al., 2006). Table 1 shows this comparison.

	Agile	Traditional
Management and organizational	Leadership and collaboration	Command and control
	Cooperative	Autonomous
	Flexible	Disciplined
	Manager as facilitator	Manager as planner
	Tacit knowledge	Explicit knowledge
	Team reward system	Individual reward system

Table 1 - Agile and traditional methods comparison

Bishop, Deokar and Sarnikar have investigated preference from a software developer's perspective (Bishop, Deokar, and Sarnikar, 2016). The current research seeks to extend that research into the area of management preference for agile software development methods. Consequently, our research seeks to identify influential factors in project manager's preference (or lack of preference) for the agile software development method. This desire led us to our research question: What are the factors that influence software development project managers' preference for or against agile methods?

RESEARCH METHODOLOGY AND PLAN

Since our goal is to develop empirically based theory we choose the grounded theory form of qualitative research. This method is well established in the field of Information Systems (Birks, Fernandez, Levina, and Nasirin, 2013; Matavire and Brown, 2008).

Unlike quantitative methods, where representative random sample of a population is critical, grounded theory uses theoretical sampling (Glaser and Strauss, 1967; Charmaz, 2006; Corbin and Strauss, 1990). Theoretical sampling seeks data from sources that will provide rich information regarding the emerging categories and theory rather than sources strictly intended to be statistically representative of the target population (Draucker, Martsolf, Ross and Rusk, 2007).

We have performed a preliminary literature review to orient our research to the literature. In keeping with grounded theory principles, we have engaged the literature review while attempting to avoid theoretical expectations and bias (Dunne, 2011). For data collection, we developed a list of semi-structured interview questions. We also have developed an initial list of managerial contacts. We will perform interviews of our initial contacts, digitally record and transcribe the narratives. We will then analyze the transcripts using grounded theory coding techniques (Charmaz, 2006). Each of the three researchers will analyze transcripts using Atlas.ti to record and visualize the emerging relationships, concepts and theory. Through constant comparison, memoing, analysis, abstraction and conceptualization theoretical constructs will emerge from the data (Glaser and Strauss, 1967).

Our research plan is to utilize the framework created by Urquhart, Lehman and Myers (2010) which provides specific guidance for developing theory in the Information Systems domain. The guidelines are described in five steps: 1) constant comparison; 2) iterative conceptualization; 3) theoretical sampling; 4) scaling up; 5) theoretical integration.

CONCLUSION

Given the continued rise in agile methods popularity in industry, it is important to have a theoretical understanding of the phenomena. A well-formed theory will assist organizations as they choose a development methodology for their projects. This research will contribute to a holistic view of preference for agile methods in the software development domain.

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